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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,389	03/20/2001	Kozo Mano	0052/042001	8768

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EXAMINER

PHAM, HAI CHI

ART UNIT / PAPER NUMBER

2861

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,389

Applicant(s)

KOZO MANO

Examiner

Hai C Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

FINAL REJECTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 7-9, 11-13, 17-19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa (U.S. 4,978,197) in view of Arimoto et al. (U.S. 4,806,951).

Horikawa discloses a beam-combining laser beam source device, which includes at least two laser light sources (first laser beam source section 3A-3E and second laser beam source section 3F-3J) for oscillating and emitting at least two laser beams having different wavelengths, an optical path adjusting system for adjusting optical paths (col. 3, lines 5-8), which comprises a first adjuster (prism mirrors 5 positioned in the optical paths of laser beams 3a-3e for adjusting the optical path of the first laser beam section), a second adjuster (prism mirrors 5 positioned in the optical paths of laser beams 3f-3j for adjusting the optical path of the second laser beam section). Horikawa further teaches to include a position sensor for monitoring whether the laser beams are converged to the predetermined positions (col. 8, lines 2-21). Horikawa also suggests the device being used in light beam scanning apparatuses, which includes an optical scanning system (light deflector) for scanning the laser beams on a predetermined scanning plane (col. 1, lines 17-21).

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However, Horikawa fails to teach the position sensor being disposed on a plane optically conjugated with the predetermined scanning plane, a beam splitter for splitting the laser beams toward the scanning plane and the position sensor directions, the adjusters being positioned between the laser light sources and a polygon mirror, the adjusters including actuators for adjusting a reflection angle of the adjusters, the calculating means, and the mirrors being rotatable in two different axes.

Regardless, Arimoto et al. discloses an optical printer having a beam scan controller, which comprises a position sensor (A₁-A₄, Fig. 12) being disposed on a plane optically conjugated with the scanning plane (col. 7, lines 19-24) for detecting a positional deviation of the laser beam on the surface of the photosensitive drum (200), and a pair of adjusters (optical deflectors 31, 32) for adjusting the optical path of each of the two laser beams emitted from the pair of laser sources (11, 12) in accordance with the detected positional deviation through a feedback loop. Arimoto et al. further teaches the use of a beam splitter (10) to split a first portion of the laser beams toward the photosensitive drum and a second portion of the laser beams toward the position sensor, and the adjusters (31, 32) being disposed between the laser light sources and a polygon mirror (5). Arimoto et al. also suggests using actuators for adjusting a reflection angle of the reflecting adjusters such that the displacement of the laser beams in both main and sub-scanning directions are corrected via the computer (1006), such correction would adjust the reflecting mirrors (31, 32) in two axes corresponding to the main and sub-scanning directions.

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Horikawa with the aforementioned teaching of Arimoto et al. By doing so, it is possible to correct the positional error as well as the focusing point of the laser beam on the surface of the photosensitive drum.

Horikawa further teaches the optical path adjusters (5) being total reflection mirrors.

3. Claim 4, 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa in view of Arimoto et al., as applied to claims 1 and 11 above, and further in view of Uemura et al. (U.S. 5,436,645).

Horikawa, as modified by Arimoto et al., discloses all the basic limitations of the claimed invention except for the monitor display.

Regardless, Uemura et al. discloses an inspection and adjustment method for a laser scanning optical system, which includes a display monitor for observing the detected laser light beam by a position sensor unit.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Horikawa, as modified by Arimoto et al., with the aforementioned teaching of Uemura et al. for the purpose of constantly monitoring the position of the detected light beam.

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4. Claims 5, 6, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa in view of Arimoto et al., as applied to claims 1, 11 above, and further in view of Ackerman (U.S. 4,560,244).

Horikawa, as modified by Arimoto et al., discloses all the basic limitations of the claimed invention except for the adjuster being a manually adjustable mirror.

However, Ackerman discloses a low-cost manually adjustable mirror for redirecting an incident laser beam, which can sustain high heat from a high beam energy sources.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Horikawa, as modified by Arimoto et al., with the aforementioned teaching of Ackerman since it is known in the art that a manually adjustable mirror can be used to redirect an incident laser beam, the selection of which would be based on the design specifications.

5. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa in view of Arimoto et al., as applied to claims 1, 11 above, and further in view of Suzuki (JP 2-236538).

Horikawa, as modified by Arimoto et al., discloses all the basic limitations of the claimed invention except for the wavelengths of the laser light sources corresponding to the three primary colors.

However, it is well known in the art of color laser printer to use the laser light sources emitting light corresponding to the three primary colors for exposing the surface

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of a photosensitive medium. Suzuki, for example, discloses a scanning type photographic printer having three laser light sources emitting light corresponding to the three primary color (RGB), a galvanometer (20) for controlling the positions of the three laser light beams in the sub-scanning direction, and a polygon mirror for scanning the three light beams in the main scanning direction over the surface of the photosensitive medium.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Horikawa, as modified by Arimoto et al., with the aforementioned teaching of Suzuki since it is known in the art of color laser printing to use a set of laser light sources that emit light corresponding to the three primary colors, and the implementation of which would involve only routine skill in the art.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa in view of Arimoto et al., and Matsuyama (U.S. 6,292,279 B1).

Horikawa, as modified by Arimoto et al., discloses all the basic limitations of the claimed invention except for the position sensor being a two-dimensional position sensitive detector.

However, Matsuyama discloses an optical system for recording using a two-dimensional detector (35) for detecting the position of the laser beam emitted from the laser (31), whose optical path is adjusted by a reflecting mirror (32), which rotates in two distinct directions.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Horikawa, as modified by Arimoto et al., to include a two-dimensional detector as taught by Matsuyama. By doing so, it is possible to accurately tract the position of the laser beams in both main and sub-scanning directions.

Response to Arguments

7. Applicant's arguments with respect to claims 1-24 have been considered, and are traversed in view of the new grounds of rejection as stated above.

Conclusion

8. Applicant's amendment, which changes the scope of the base claims 1 and 11, necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



HAI PHAM
PRIMARY EXAMINER

November 2, 2002